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Attorney Docket: 218TG/48722
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: PETER HEINRICH ET AL.

Serial No.: 09/524,755

Group Art Unit: 2625

RECEIVED

Filed: MARCH 13, 2000

Examiner: Sheela Chawan

MAY 02 2003

Title: QUALITY ASSURANCE DURING THERMAL SPRAY
COATING BY MEANS OF COMPUTER PROCESSING
OR ENCODING OF DIGITAL IMAGES

Technology Center 2600

REQUEST TO RE-START TERM FOR RESPONSE

Commissioner for Patents
Washington, D.C. 20231

Sir:


We are awaiting the original Office Action from the U.S. Patent and Trademark Office for the above-identified application. Apparently the Office Action was originally mailed to the wrong law firm. After several telephone conversations with Examiner Chawan and a telephone conversation with her supervisor on April 24, 2003, Examiner Chawan faxed the attached Office Action to our office. However, Examiner Chawan did not include a cover page bearing the mailing date of the original Office Action. After a telephone call to the Examiner inquiring about the mailing date of the Office Action, she informed us that the official file was not in her possession, therefore she could not provide a cover page. Examiner Chawan then informed us that the mailing date, according to the U.S. Patent Office's computer system, was January 30, 2003.

In view of the above discrepancy, the Commissioner is hereby respectfully requested to forward an original copy of the Office Action and to re-start the term for response to the Office Action.

If there are any questions regarding this Request or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

Respectfully submitted,

April 30, 2003



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DETAILED ACTION

Priority

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1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to because of draftsman's remarks (see attached PTO-948 paper number 8). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Allowable Subject Matter

3. Claims 2, 5, 21 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, the prior art fails, to teach a thermal spray coating method, wherein said at least one characteristic of the thermal spray coating method affecting the quality of the coating layer is selected from the group consisting of gas flows, current strengths, spraying distance, spraying angle, a velocity of a coating jet relative to a substrate surface, and a quantity of sprayed powder.

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As per claim 5, the prior art fails, to teach a method wherein the symmetric geometrical surface regions are selected from the group consisting of circles, squares, rectangles, parallelograms, ellipses, and combinations thereof.

As per claims 21 and 22, the prior art fails, to teach the wherein said characteristics include at least one of a vertical position of the ellipse, center-out-mass, a horizontal position of the ellipse center-out-mass, a length of first and second semi-axes, and an angle of one of the semi-axes to the horizontal.

Claim Rejections - 35 U.S.C. § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 4, 8-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savkar et al., (US.5,047,612, Listed in IDS paper # 7), in view of Hill et al., (US.5,633,123).

As per claims 1,4,9,11-13, 15 Savkar teaches a thermal spray coating method, comprising:

recording (column 9, lines 53-65), controlling (abstract, column 2, lines 15-20) , and/or monitoring (column 2, lines 15-20) at least one characteristic of the thermal spray coating method affecting the quality of the coating (column 2, lines 32-41, column 3, lines 18-29) layer by creating images with a digital camera (column 2, lines 21- 41); and

assigning the images of at least one region of equal intensity (column 5, lines 16-52).

Savkar discloses an apparatus and method for controlling the deposition of a powder in a plasma spray process, and particularly to an apparatus and method in which the location and pattern of powder deposition is monitored and controlled, but fails to specifically mention about one or more symmetric geometrical surface regions by computer processing or encoding.

However, Hill discloses a method of forming a shaped image in a workpiece. More specifically, the present invention relates to a method of forming a shape image in a workpiece using a high energy source and a layer disposed proximate the workpiece such that the layer prevents debris from the workpiece thereon, a laser is directed toward the workpiece and a mask is provided between the laser and debris -blocking layer. The laser may be an ultraviolet laser and the debris-

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blocking layer should be transparent to the light emitted by the laser . The patterns formed on this layer may include concentric or spiral optical servo tracks in the magnetic coating (column 6, lines 64-67, column 7, lines 1-17 , as shown by Hill the use of one or more symmetric geometrical surface regions by computer processing, because the patterns formed on this layer is capable of forming an optimum image in the coating or the boundary portion (column 6, lines 64- 67, column 7, lines 1-8).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of invention to incorporate the teaching as taught by Hill 's into the system of Savkar, because, one with ordinary skill in the art would realize that it is capable of forming an optimum image in the coating or the boundary portion as suggested by Savkar at (column 4, lines 10- 23).

As per claims 3 and 7, Hill teaches a method according to Claim 1, wherein said assigning comprises recording the one or mere symmetric geometrical surface (column 6, lines 64- 67, column 7, lines 1 - 17) regions as a data record based on independent typical characteristics of the respective geometric shape (column 6, lines 64- 67, column 7, lines 1 - 17).

As per claim 8, Hill teaches a method according to Claim 1, wherein the computer processing and/or encoding is carried out by at least one of a contour detection algorithm, a gradient steps representation , or a gradient accentuating representation reduced to bit planes (column 7, lines 34-47).

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As per claims 10 and 14, Savkar teaches a method according to Claim 3, further comprising controlling or optimizing one or more parameters of the thermal spray coating process with the symmetric geometrical surface region or the data record (column 2, lines 49-68).

As per claim 16, the same limitations as set forth in claim 1 are contained as an independent claim (refer to claim 1 for common features) except for steps of claim 16, as taught by Savkar which recites a computer readable program code means for causing said computer to store in an array values representing the boundaries of the various intensity levels of said digital image and means for causing said computer to compare said stored boundary values of said images with stored values for one or more symmetric geometrical surface regions and to chose the closest matches for each of said various intensity levels resulting from said comparison (column 5, lines 10- 68, column 3, lines 4-17, column 8, lines 36-59);

computer readable program code means for causing said computer to determine a plurality of characteristics of said chosen symmetric geometrical surface regions and compile a listing of said characteristics as a data base in order to monitor quality of the event (column 7, lines 7- 63). As per claim 17, Hill teaches the computer program product according to claim 16, wherein the event is a thermal spray coating (column 10, lines 8-27) .

As per claim 19 is representative of claim 16.

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6. Claims 6, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Savkar et al., (US.5,047,612, Listed in IDS paper # 7), in view of Hill et al., (US.5,633,123), as applied to the above claims 1-4, 7- 17 and 19 and further in view of Bok et al., (US.5,171,613).

Regarding claims 6,18 and 20, Savkar discloses an apparatus and method for controlling the deposition of a powder in a plasma spray process, and particularly to an apparatus and method in which the location and pattern of powder deposition is monitored and controlled, but fails to specifically mention about wherein the symmetric geometrical surface regions are ellipses. However, Bok discloses a method and apparatus of the present invention, have now been provided which maintain the spray temperature of the coating mixture, whether sprayed in a single-pass or multi-pass mode, such that proper atomization is provided which is manifested by obtaining a feathered spray pattern. The system comprises of:

wherein the symmetric geometrical surface regions are ellipses (column 24, lines 2-15), as show by Bok the use of wherein the symmetric geometrical surface regions are ellipses,

because to reduce gas flow rate (column 24, lines 12- 14).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of invention to incorporate the teaching as taught by Bok's into the system of Savkar, because, one with ordinary skill in the art would realize that it would reduce gas flow rate, as suggested by Bok at (column 24, lines 12- 14).

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Other prior art cited

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Thaggard (US.6,190,727) discloses liquid coating spray applicator and method providing automatic spread rate control .

Moffat (US.5,171,393) discloses wafer processing apparatus .

Schutz (US.5,912,471) discloses apparatus and method for monitoring the coating process of a thermal coating apparatus.

Meyer et al., (US.4,962,461) discloses method for the reproducible formation of material layers and/or the treatment of semiconductor materials layers.

Klein, II et al., (US.5,757,498) discloses optical spray coating monitoring system and method .

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Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela Chawan whose telephone number is (703) 305-4876. If attempts to reach the examiner on Monday through Thursday from 8:00 a.m. to 5:00 p.m. by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached at (703) 308-5246.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

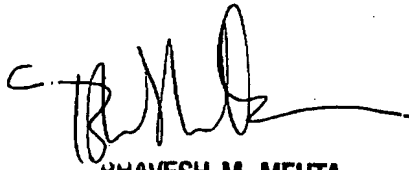
Washington, D.C. 20231

or faxed to:

(703) 872 - 9314, (for formal communications intended for entry)

Or: Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703)305-4750.

Sheela Chawan
Patent Examiner
Group Art Unit 2625
Jan 24, 2003


BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
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